REMARKS

Reconsideration is respectfully requested of the above identified application in view of the amendments above and remarks following.

Claims 1-41 are in this application. Claims 21-26, 32-35 and 41 have been withdrawn. Claims 1, 2, 9, 13, 16, 19, and 41 have been amended. New claim 42 is added. Support is found in claims 2, 9 and 13.

New Claim 41

New claim 41 has been withdrawn as directed to a non-elected invention. Applicant respectfully disagrees. Claim 41 as amended falls within the scope of the claims are currently being examined and thus presents no greater burden to the Examiner and should be examined herewith. Applicant requests claim 41 be re-instated.

Objections to Abstract

The Abstract was previously amended according to the Examiner's suggestions. The Examiner now states that the abstract is objected to because it can easily accommodate the preferred structure of the catalyst system without exceeding the length limitations for an abstract. The Examiner cites MPEP § 608.01 (b) to support the objection. The abstract has been amended as the Examiner suggests. In the event the Examiner still objects to the Abstract, perhaps he could suggest the exact amendment he would like to see?

In view of the above, withdrawal of the objection is respectfully requested.

Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 1-20, 27, 29-31 and 36-40 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regards as their invention. Reconsideration is respectfully requested.

Claim 1 has been amended in the manner as suggested by the Examiner.

Claim 9 has been amended in the manner as suggested by the Examiner.

Claim 10, and 29-31 have been rejected because the Examiner suggests that "having a three membered ring would appear to be too strained to exist." It is respectfully submitted that the 3 membered ring as proposed in the instant claims are not to strained and can exist. The 3 membered ring would include the metal center. Note that the X atoms do also form a part of the ring. Further, Applicant notes that three membered metallacycle rings are well known in the literature, for example please see pages 60-61 of *Organotransition Metal Chemistry*, Akio Yamamoto, John Wiley and Sons, New York, 1986 (copy enclosed). Thus Applicant respectfully submits that the Examiner's suggestion that a three membered ring is too strained to exist is not correct and should not form the basis of a rejection under 35 USC § 112. Withdrawal of this rejection under 35 U.S.C. §112 is respectfully requested.

Claim 13 has been amended to remove the various oxy compounds. New claim 42 recites the various oxy compounds.

Claim 16 has been amended as suggested by the Examiner.

Claim 19 and 20 are rejected as inconsistent with claim 2. Claim 19 has been rewritten in independent form to address this issue.

In view of the above, withdrawal of the rejections under 35 U.S.C. §112, second paragraph is requested.

Claim Rejections Under 35 U.S.C. §102

Claims 1, 2, 5-8, 11, 12, 15 and 16 have been rejected under 35 U.S.C. §102(b) as being anticipated by Sumi et al. (hereinafter referred to as Sumi). The Examiner holds that the invention as claimed is anticipated when one construes the term "activator... broadly." This rejection is respectfully traversed.

Firstly, it is respectfully asked that the Examiner present a more detailed explanation of what is meant by "construing the term activator broadly." It would appear from the nature of the Examiner's position that should the term "activator" be more narrowly defined that the rejection would be removed. Further clarification is respectfully requested.

In any event, it is respectfully submitted that Sumi does not disclose activators as understood in the instant claims and particularly claims 1, 2, 19, 28, 29, 30, and 31 which require specific activators (e.g. *wherein the activator is an alumoxane, an aluminum alkyl, an alkyl aluminum halide, an alkylaluminum alkoxide, a discrete ionic activator, or a Lewis acid.*). The reason of course is that activators are not involved in the Sumi case since Sumi does not produce polymer or oligomers. Sumi is directed toward mediated organic reaction to make organic compounds.

In any event, it is respectfully submitted that Sumi does not anticipate Applicants' invention. Sumi does not disclose any compound that fits the word formula of claim 1 or the structural formula of claim 2. Throughout Sumi all that is disclosed is the ligand as represented by his formula (1). Nowhere within the four corners of Sumi is there any specific disclosure of a catalyst that is represented by the structural formulas recited in the instant claims and as typically represented by the formula in claim 2. Note also that Sumi does not disclose or make obvious the Y groups listed in Claim 17. The only allegedly Y group in Sumi is bi-naphthals.

At Col. 16, line 66 carried over to Col. 17, line 49 Sumi mentions certain transition metals, but Sumi does not demonstrate what would be the results of reacting his MAP with the transition metals. More particularly, there is no disclosure within Sumi that would represent the Applicants' composition that contains the abstractable ligands X. It is respectfully submitted that absent such a disclosure containing the transition metal bonded to the N and P atoms and further containing the abstractable ligands that Sumi does not anticipate the instant claims. Withdrawal of the rejection is respectfully requested.

Claims 1, 2, 5-8, 11, 12 and 14 -18 have been rejected under 35 U.S.C.102(b) as being anticipated by Buchwald et al. (hereinafter referred to as Buchwald). As under the Sumi rejection discussed above the Examiner suggests that the invention as claimed is anticipated when one construes the term "activator" broadly. This rejection is respectfully traversed.

As under Sumi discussed above, it is respectfully requested that the Examiner present a more detailed explanation of what is meant by "construing the term activator broadly." It would appear from the nature of the Examiner's position that should the

term "activator" be more narrowly defined that the rejection would be removed. Further clarification is respectfully requested. In any event the activators in claim 1 are quite specific and none of these activators are mentioned in Buchwald. (e.g. alumoxane, an aluminum alkyl, an alkyl aluminum halide, an alkylaluminum alkoxide, a discrete ionic activator, or a Lewis acid are not mentioned in Buchwald). As mentioned below our activators are acids whereas Buchwald's "additional reagents" are bases.

Secondly, it is respectfully submitted that Buchwald does not anticipate Applicants' invention because it does not specifically disclose bridged complexed structures as instantly recited in Applicants' claims. Buchwald does not disclose any compound that specifically fits the word formula of claim 1 or the structural formula of claim 2. Throughout Buchwald, all that is disclosed is the ligand which Buchwald suggests to react with certain transition metal compounds. No where within the four corners of Buchwald is there any specific disclosure of a catalyst that is represented by the structural formulas recited in the instant claims and as typically represented by the formula in claim 2. Buchwald does not demonstrate what would be the results of reacting his ligands with the transition metals. More particularly, there is no disclosure within Buchwald that would represent the Applicants' composition that contain the abstractable ligands X. It is respectfully submitted that absent such a disclosure containing the transition metal bonded to the N and P atoms and further containing the abstractable ligands that Buchwald does not anticipate the instant claims. It should also be noted that Buchwald states that the metal should be in a zero but not the highest oxidation state (I) so that they are capable of undergoing oxidative addition. Applicants' metals such as Ni and Pd are Ni(II) and Pd(II) not the Ni(I) and Pd(0) of Buchwald. Furthermore there is no disclosure of an activator and that is because Buchwald does not need an activator for purposes disclose by Buchwald. The equating of "additional reagent" that is sometimes needed - see columns 33, line 55 with activators is stretching the meaning of Buchwald. In any event these additional reagents are bases whereas Applicants' activators are acids. Withdrawal of the rejection is respectfully requested.

Claims 1, 2, 5-8, 11, 12 and 14-18 have been rejected under 35 U.S.C.102(e) as being anticipated by Zhang et al. (hereinafter referred to as Zhang). As under the Sumi

rejection discussed above the Examiner holds that the invention as claimed is anticipated when one construes the term "activator" broadly. This rejection is respectfully traversed.

As under Sumi discussed above, it is respectfully asked that the Examiner present a more detailed explanation of what is meant by "construing the term activator broadly." It would appear from the nature of the Examiner's position that should the term "activator" be more narrowly defined that the rejection would be removed. Further clarification is respectfully requested.

Zhang does not present a compound that contains the metal atoms as recited in the instant claims. Particularly, Zhang does not disclose a compound that has a N and P atom bonded to such metal which metal further contains the abstractable ligands that are recited in the instant claims. Furthermore, Zhang does not have two substituents on the N atom that are required in accordance with the instant invention. In Applicants' claims N has an R^1 and R^2 substituent. Zhang does not disclose an R^1 and R^2 substituent.

Zhang does disclose the ligands but merely suggests that the ligands can be contacted with certain transition metal compounds. Nevertheless, there is no disclosure as to what such contact products would look like. Furthermore there is no disclosure of any such compound as instantly claimed that contains the abstractable ligands bounded to the metal as required in the instant claims. Withdrawal of the rejection is respectfully requested.

Claim Rejections Under 35 U.S.C. §103

Claims 1-8, 11, 12, 15, 16 and 40 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Sumi. The Examiner states that Sumi "lacks disclosure of prepolymerizing its catalyst." It is respectfully submitted that no specific catalyst is disclosed by Sumi. Sumi merely suggests that the MAP may be used as a ligand of a complex of a transition metal. There is no suggestion that the proposed catalyst can be employed for anything but asymmetric hydrogenation. As such one of ordinary skill in the art would not think to prepolymerize such catalyst since there is no suggestion that such catalyst can be employed in a polymerization reaction.

The Examiner is apparently taking a disclosure that does not contain Applicants' claimed structure and then suggesting that Sumi could prepolymerize the undisclosed

catalyst because such modifications would have been conventional to the routineer in the art. The Examiner then states it would have been obvious to one of ordinary skill in the art to apply that skill to the disclosure with a reasonable expectation of obtaining a highly-useful catalyst with the expected benefit of the catalyst being usable in a slurry phase polymerization process. Firstly, it is respectfully submitted that the routineer concerned with the Sumi invention would have the ordinary skill in the art of asymmetric hydrogenation not polymerization. Secondly there is no disclosure within the four corners of Sumi that his hypothetical catalyst could be employed in a polymerization process. It is therefore submitted that Sumi fails as a reference under 35U.S.C. § 103. Withdrawal of the rejection is respectfully requested.

The Examiner has rejected claims 1-8, 11, 12, 14-18 and 40 under 35 U.S.C. § 103 as unpatentable over Buchwald (Paragraph 11) and Zhang (Paragraph 12) for reasons substantially identical to the obviousness type rejection over Sumi. For reason recited in discussing Sumi under 103 it is respectfully submitted that the rejections over Buchwald and Zhang should be withdrawn.

Claims 1-20, 27-31 and 36-40 have been rejected under 35 U.S.C. § 103 (a) as being unpatentable over any of Sumi, Buchwald or Zhang in view of Yorisue (JP-09-255713). This rejection is respectfully traversed. Firstly, the examiner admits that none of the primary references disclose the use of alkyl aluminum or alumoxane compounds as cocatalysts for their catalysts. Secondly, as discussed above, each of the primary references does not disclose specific catalysts. The primary references discuss hypothetical catalysts. Thirdly, even if one would argue that they do disclose catalysts, none of the catalysts contain the abstractable ligands as required in accordance with Applicants' invention. Fourthly, the primary references do not address polymerization catalysts. The needs that are disclosed in the primary references do not require alkyl aluminum or alumoxanes since the hypothetical catalysts are not polymerization catalysts. It is respectfully submitted that Yorisue does not solve any of the deficiencies of the primary references. Withdrawal of the rejection is respectfully requested.

Related Application

This application relates to similar subject matter in USSN 10/693,584, filed October 24, 2003. The Examiner is encouraged to review both applications in light of each other.

CONCLUSIONS

Applicants have made an earnest effort to place their application in proper form and to establish the patentability of their claimed invention over the applied prior art. WHEREFORE, reconsideration of this application, entry of the amendments, withdrawal of the art, rejoinder of the withdrawn claims, and allowance of the amended claims herein are all respectfully requested.

Please charge any deficiency in fees during the entire pendency of this application or credit any overpayments to Deposit Account No. 05-1712.

Any comments or questions concerning the application can be directed to the undersigned at the telephone number given below.

Respectfully submitted,

Dec 18, 2006
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Fundamental Concepts and Applications

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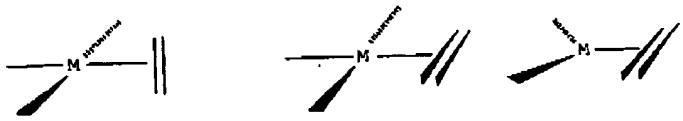


(a) perpendicular coordination (b) in-plane coordination

Which coordination mode is adopted is determined by the electronic and steric properties of the transition metal fragment and the coordinated olefin. In Zeise's salt, where ethylene is coordinated to d^8 Pt(II), perpendicular coordination is preferred, whereas in a d^{10} complex of Ni(0) such as $Ni(C_2H_4)_3$ in-plane coordination is favored. Rationales for the preferred coordination mode in these cases have been provided by semiempirical as well as ab initio MO calculations.[32-38]

In some cases the coordinated olefin can rotate about the metal–olefin bond axis. A barrier of about 60 kJ mol^{-1} has been calculated theoretically for changing from in-plane coordination to perpendicular coordination in d^8 and d^{10} olefin complexes,[21,36-38] this value being in reasonable agreement with the experimental value for the olefin rotation barrier.[39,40]

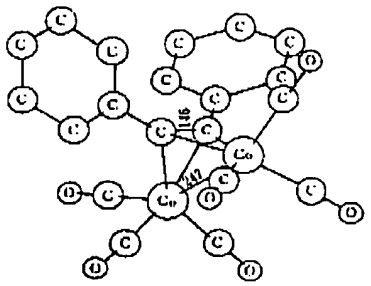
As the back bonding from the metal to the olefin increases, the C=C bond is weakened and approaches a single bond, as can be seen in tetracyanoethylene (TCNE) complexes. In addition, the originally planar olefin becomes nonplanar, with the substituents bending away from the metal atom and other ligands. In extreme cases the carbon atoms bound to the metal approach tetrahedral sp^3 hybridization, as established by the X-ray structural determination.[27] The bond can be thus regarded as a metal-containing cyclic compound called a metallacycle:

(a) side-on coordination (b) metallacycle (3.7)

In going from side-on coordination to a metallacycle formation, the metal may be regarded as being oxidized by two units. However, as a convention, we regard the sideways bonded molecules as neutral ligands that do not alter the formal oxidation state of the metal, since the transition from (*a*) to (*b*) is a question of degree, with a smooth gradation from one description to another, and there is no stepwise change of the formal oxidation state.

(6) π Bonding with Acetylenes

Since acetylene has two mutually orthogonal orbitals, it is capable of bonding to two metal atoms through the π orbitals.[41,42] Figure 3.11 shows the molecu-



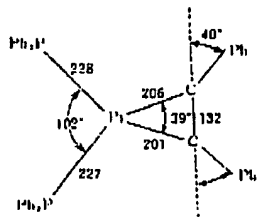
3-13

FIGURE 3.11. The molecular structure of (diphenylacetylene)hexacarbonyldicobalt. Numbers are in picometers. (Reprinted with permission from W. G. Sly, *J. Am. Chem. Soc.*, 81, 18 (1959). Copyright 1976 American Chemical Society.)

lar structure of an acetylene complex, $(C_6H_5C{\equiv}CC_6H_5)Co_2(CO)_6$ (3-13), where diphenylacetylene is bound to two cobalt atoms.[43] The two carbon atoms of the acetylene molecule have a distorted tetrahedral configuration, with the phenyl rings bending away from the cobalt atoms.

The acetylene molecule need not always coordinate with two metal atoms and can bond to a single metal atom using only one pair of π electrons in the same way as do olefins. Figure 3.12 shows the molecular structure of a diphenylacetylene complex of this type (3-14).[44]

In this complex two phosphorus atoms of the triphenylphosphine ligands, the platinum atom, and two carbon atoms of the acetylene molecule are in a plane with the two phenyl groups bending away from platinum. The C≡C bond length is lengthened from 119 pm of the original, uncoordinated diphenylacetylene to 132 pm, which is close to the normal C=C double bond. The C≡C stretching frequency is also greatly lowered, to 1750 cm^{-1}, from that of free diphenylacetylene, at 2223 cm^{-1}. For acetylene complexes of earlier transition metal complexes, however, acetylene–metal interaction utilizing the two orthogonal sets of π and π* orbitals involving four-electron donation has been noted.[21,42]



3-14

FIGURE 3.12. Molecular structure of bis(triphenylphosphine)diphenylacetyleneplatinum(0). (From J. O. Glanville et al., *J. Organometal. Chem.*, 7, 7 (1967), with permission.)